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Trámite : **011** Evento : **378** Actuación : **538**

Referencia : Expediente No. 06099845
Asunto : Solicitud de patente para IMPLANTE INTERVERTEBRAL MODULAR O PÓTESIS DE DISCO INTERVERTEBRAL
Solicitante : SYNTHES GMBH
Publicada en : La Gaceta No. 583 del 18 de diciembre de 2007

SOLICITUD EXAMEN DE PATENTABILIDAD

1. Yo, Emilio FERRERO, identificado como aparece al pie de mi firma, actuando como apoderado de la sociedad SYNTHES GMBH, atentamente solicito se efectúe el examen de patentabilidad de la solicitud en referencia presentada de acuerdo con las reglas del Capítulo I del PCT y según lo establecido en el artículo 44 de la Decisión 486 de la Comisión de la Comunidad Andina.

Para tal efecto presento junto con este escrito el recibo No. 08-46,043 por valor de $420.000.oo que corresponde a la tasa legal fijada para el efecto.

2. Por lo anterior, comedidamente solicito se prosiga con el trámite de este asunto.

Señora Jefe,

EMILIO FERRERO
T.P.A. No. 31.929

COLO-15153-841-022-7
SCT\SCT\ID-127993\WPC15153
No. M-2008-127993\SCT

(12) **United States Patent**
Fleischmann et al.

(10) **Patent No.: US 6,375,682 B1**
(45) **Date of Patent: Apr. 23, 2002**

(54) **COLLAPSIBLE, ROTATABLE AND EXPANDABLE SPINAL HYDRAULIC PROSTHETIC DEVICE**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/922,161**

(22) Filed: **Aug. 6, 2001**

(51) **Int. Cl.**[7] **A61F 2/44**
(52) **U.S. Cl.** **623/17.12**; 623/17.15; 623/17.16
(58) **Field of Search** 623/17.12, 17.15, 623/17.16, 17.11, 16.11

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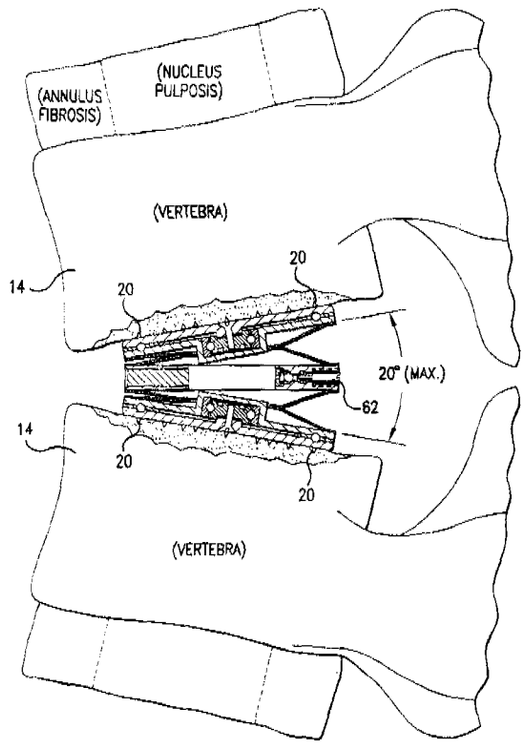
(57) **ABSTRACT**

A spinal prosthetic device (**10**) which is hydraulically expanded or retracted, either pre-implantation or in-situ, thereby being adjustable for the exact intravertebral axial spacing required for the patient. Thrust bearing members (**22**) are positioned between the vertebra engaging members (**12**) and a pair of bellows (**26**), allowing the collapsible/expandable bellows (**26**) to be rotated with respect to the vertebra engaging members (**12**). The device (**10**) can be readjusted, on an out-patient basis, months after initial implantation. The spinal prosthetic device (**10**) offers all degrees of motion afforded by the anatomical spinal disc and by virtue of incorporating no rubbing contact of any parts, exhibits and infinite working life. The spinal prosthetic device (**10**) reproduces the same hydraulic load bearing capability as the nucleus pulposis and flexural freedom of movement similar to the annulus fibrosis.

27 Claims, 8 Drawing Sheets



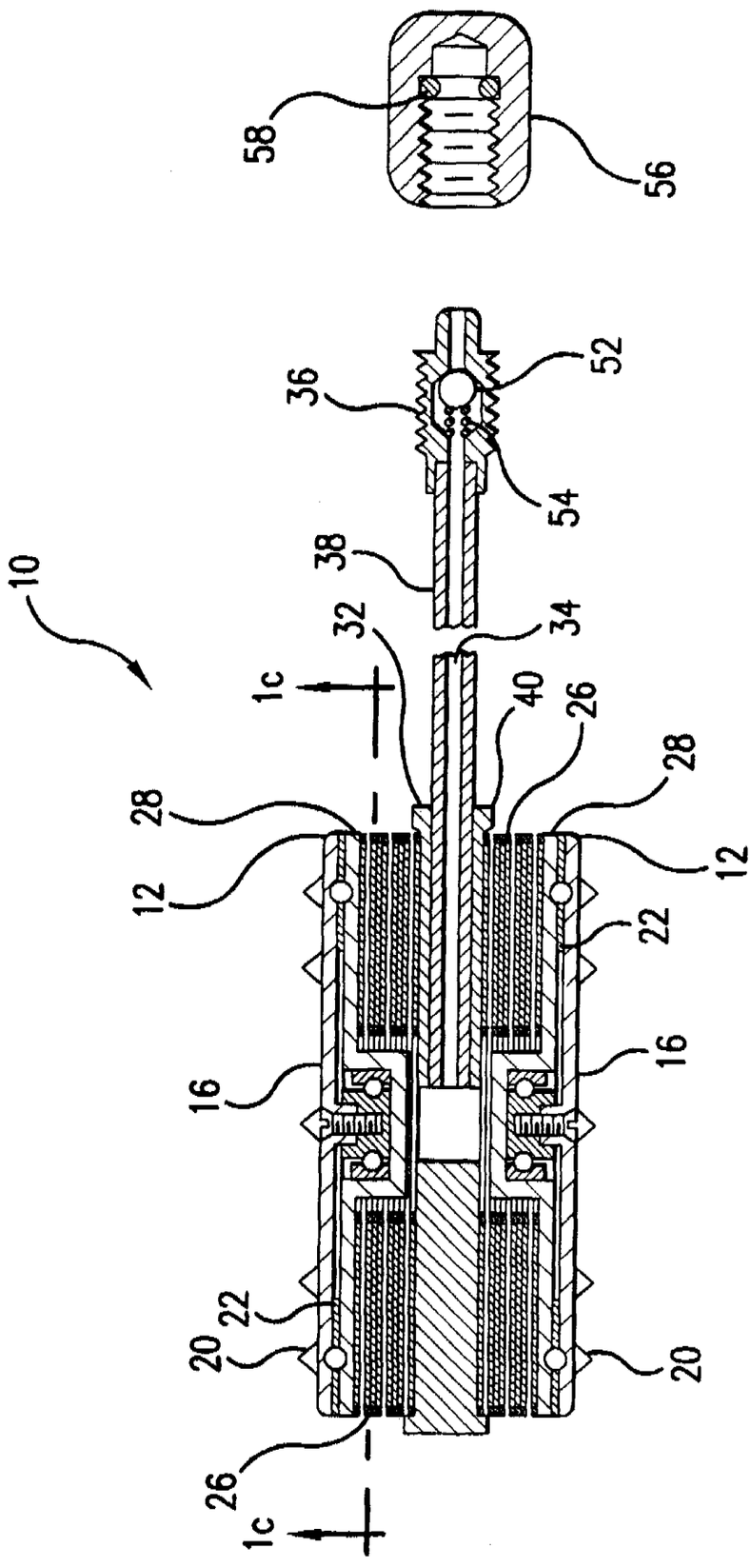


FIG. 1b

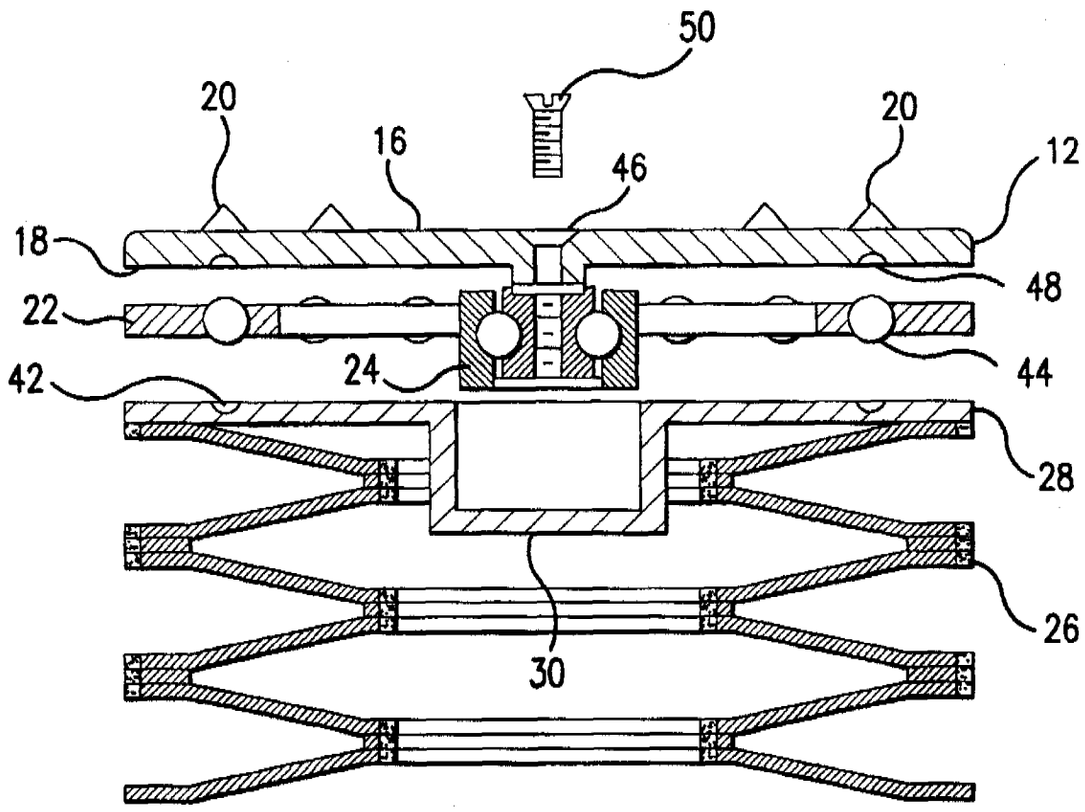


FIG. 1c

It is an important objective of the present invention to provide a spinal prosthetic device having a valve assembly allowing for the variable filling of the prosthesis with a mixture of incompressible and compressible fluids, thus allowing for a variable height of the prosthesis between the two vertebrae and also allowing for variable axial compression-movement within the prosthetic segment.

It is a further objective of the present invention to provide a spinal prosthetic device having load bearing capability afforded via a bellows configurational device.

It is an objective of the present invention to provide a spinal prosthetic device having a liquid filled metallic washer convoluted design to permit flexural movement but resist parallel shear movement.

It is a further objective of the present invention to provide a metallic bellows which affords flexing of the convolution elements which mimic natural body movements.

It is an objective of the present invention to provide a bellows design permitting axial height adjustment either pre or post implantation which can be adjusted to precisely fit the patient's intravertebral space requirement.

It is a further objective of the present spinal implant to provide an extension hose which allows for post operative intravertebral gap adjustments.

It is an additional objective of the present invention to provide a device which can be implanted in the space formerly occupied by the nucleus pulposis whereby the annulus fibrosis is left intact.

It is a further objective of the present spinal implant device to provide a system which can be substituted in place of the entire anatomical disc.

It is an important objective of the present invention to provide a spinal implant with a virtually infinite life expectancy and with no chance of rejection by the body.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1***a* is a top view of the subject spinal prosthetic device;

FIG. **1***b* is a cross-sectional view of the subject spinal prosthetic device;

FIG. **1***c* is an exploded view of the top half of the subject spinal prosthetic device;

FIG. **2***a* is a top view of the preferred embodiment of the spinal prosthetic device;

FIG. **2***b* is a cross-sectional side view of the subject spinal prosthetic device;

FIG. **2***c* is a side view of extension tubing used in conjunction with the spinal prosthetic device;

FIG. **2***d* is a cross-sectional view of a charge fitting device used in conjunction with the spinal prosthetic device;

FIG. **3** is a cross-sectional side view of the spinal prosthetic device implanted between two vertebrae;

FIG. **4***a* is a top view of an alternate embodiment of the spinal prosthetic device;

FIG. **4***b* is a side view of the alternate embodiment of the spinal prosthetic device; and,

FIG. **5** is a graph showing a typical Stress vs. Strain curve for a typical metal material.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to FIGS. **1***a*–**1***c*, there is shown a collapsible, rotatable and expandable spinal hydraulic prosthetic device **10**. As shown in FIG. **1***b*, the prosthetic device **10** includes a pair of collapsible, expandable bellows **26**, a pair of first vertebra engaging members **12** and a base plate member **32** having a fluid channel **34** formed therethrough.

Base plate member **32** incorporates a means for filling and bleeding fluids into or out of the assembly. The valve connector **36** can be incorporated within the base plate, as shown in the embodiment of FIG. **2***b*, or remotely, as shown in FIG. **1***b*. As shown, a capillary tube **38** fluidly connects valve connector **36** with base plate member **32**. The capillary tube **38** may be formed from either ductile titanium metal or may be replaced by a flexible braid reinforced silicone rubber tube, as shown in FIG. **2***c* of the Drawings.

As shown in FIG. **1***a*, the vertebra engaging members **12** are substantially circular and may incorporate a layer of sintered titanium on upper vertebra engaging surface **16**. The first vertebra engaging surface **16** has a plurality of projections **20** projecting therefrom. The projections, or spikes, **20** laterally affix or set the vertebra engaging members **12** to their respective vertebrae.

The projections or spikes **20** are shown in FIGS. **1**B, **1**C, and **2**B as having a triangular cross-section. The spikes **20** may be of any suitable size or shape for engaging the vertebra **14**, as shown in FIG. **3**.

The spikes **20** may be formed from sintered titanium, solid titanium, or any other suitable material providing biocompatibility and both compressive and shear strength. Due to the fact that the spinal cord is especially sensitive to injury and damage, it is necessary that the spikes **20**, as well as the other elements forming the spinal prosthetic device **10**, such as the base plate member **32** and the collapsible bellows **26**, be formed from strong, resilient and biocompatible materials such as titanium and other like metals or plastics compositions. Sintered titanium, for example, allows for longevity, strength, and no potential for rejection of the elements forming the spinal prosthetic device **10** by the body. Further, a prosthetic element formed from sintered titanium promotes bone growth in and around the element.

FIG. **1***b* is a cross-sectional view of the spinal prosthetic device **10**, taken along line **1***b* of FIG. **1***a*. As shown in FIG. **1***b*, the base plate member **32** includes a pair of opposing outer planar surfaces **40** to which the pair of flexible bellows **26** are fixedly secured. The flexible bellows **26** are formed from a plurality of titanium washers securely joined together through laser welding, electron beam welding, resistance welding, or some other suitable method. Similarly, the flexible bellows **26** may be joined to the outer planar surfaces **40** of base plate member **32** through laser welding, electron beam welding, or any other suitable method.

The plurality of titanium washers forming the flexible bellows **26** allow for vertical flexibility and collapsibility/extendability of the bellows and also act to prevent lateral movement of the bellows. The sensitivity of the spinal cord to damage requires that the spinal prosthetic device **10** be both flexible along the main vertical axis and resistant to lateral shear movement; i.e., movement that would bend the bellows into a parallelogram shape. A rocking motion of the prosthetic device **10** is desired for natural movement.

As shown in FIG. **1***c*, the collapsible bellows **26** are sealed on one end by end cap **28**. End cap **28** may be made of titanium or any other suitable, strong and rigid metal material, which is weld compatible with bellows **26**. End cap **28** is bonded to collapsible, extendible bellows **26** through welding or any other suitable means. As shown, end cap **28** is formed with bearing recess **30** formed therein. Additionally, end cap **28** has an annular groove **42** formed therein.

Thrust bearing member **22**, as best shown in FIG. **1***c*, incorporates multiple hardened steel ball bearings captured within a biocompatible washer seal material. As shown in FIGS. **1***b* and **1***c*, a radial bearing assembly **24** is positioned in the center of the substantially annular thrust bearing member **22**. The radial bearing assembly **24** is received within the bearing recess **30** of end cap **28**. The ball bearing projections of the thrust bearing member **22** are received within the annular groove **42** formed on the end cap **28**.

The vertebra engaging member **12** incorporates a sintered titanium planar surface **16** with projections **20** projecting therefrom. Opposite upper surface **16** is lower surface **18** which has an annular groove formed therein. The vertebra engaging members **12** each have a through hole **46** formed through the center of the annular plate.

Ball bearing members **44** of thrust bearing member **22** are received within the annular groove **48** of the vertebra engaging member **12**. The vertebra engaging member **12** is fixed to the thrust bearing member **22** by screw **50**, which is received within the radial bearing assembly **24**.

When the vertebra engaging members **12**, the thrust bearing members **22**, and the collapsible, extendible bellows **26** are assembled, as shown in FIG. **1***b*, the collapsible, extendable bellows and the base plate member **32** are free to rotate with respect to the vertebra engaging members **12**. FIG. **3** illustrates the spinal prosthetic device **10** implanted between two vertebrae **14**. The prosthetic device **10** may replace an entire diseased spinal disc or it may be positioned within the nucleus pulposis space of a spinal disc wherein the nucleus pulposis material is removed.

As shown in FIG. **3**, projections **20** engage the bone of the vertebrae, holding the spinal prosthetic device in place with respect to the spine. The rotation of the collapsible, extendable bellows **26** and the base plate member **32** with respect to the vertebra engaging members **12** allows for a fully rotating and articulating motion of the prosthetic device **10** with respect to the adjoining vertebrae **14**. Thus, the spinal prosthetic device **10** provides for natural movement of the spine.

A silicone grease or other biocompatible lubricant may be present on either surface of the thrust bearing member **22** in order to add lubrication to end cap **28** and vertebra engaging member **12** with respect to the thrust bearing member **22**. In order to provide full articulated movement within the spine, it is necessary that the collapsible, extendable bellows **26** be rotatable with respect to the two vertebrae **14**. This rotation provides both natural rotating movement of the spine and also decreases the risk of injury and dislocation of the vertebra engaging members **12** with respect to the vertebrae **14**.

As shown in FIG. **1***b*, valve connector **36** is provided with an outer thread and includes ball check **52** which is biased in the closed position by spring **54**. End cap **56** is provided as a back-up sealing means after all filling adjustments have been completed. End cap **56** has a threaded recess formed therein for receiving the threads of valve connector **36**. Also received within the recess of end cap **56** is an O-ring seal **58**.

Valve connector **36** is provided for the filling of the collapsible, extendable bellows **26** with either an incompressible liquid or a mixture of a liquid and a gas. Fluid flows through fluid channel **34** of capillary tube **38** to fill the bellows assembly **26** to a predetermined height, depending upon the desired intervertebral spacing.

FIG. **2***b* shows the preferred embodiment of the spinal prosthetic device **10**. Valve connector **36** is integral with base plate member **32**, as shown. Further, the bellows assembly **26** are each comprised of two conical washers formed of titanium or like composition. This configuration is pre-expanded to approximate the final desired gap between the vertebrae **14** and relies on the surgeon to distract the vertebrae with a distractor tool prior to implantation of the device. The device can be sized to fit into the space formerly occupied by the nucleus pulposis when the annulus fibrosus is left intact or sized with a larger diameter to fit between the vertebrae **14** when the annulus fibrosus has been removed. Using only four or fewer flexible Belleville type washers, as shown in FIG. **2***b*, the total number of degrees of bending are limited to approximately 20°, which approximates normal spinal disk movement.

FIG. **2***d* illustrates a charge fitting **60** adapted for use with valve **36**. Charge fitting **60** is received within valve connector **36**. The charge fitting includes a hypodermic needle **64** which passes through O-ring seal **58**, effecting a seal. As the fitting **60** is further inserted into valve connector **36**, needle **64** pushes the ball check **52** away from its seat and further compresses the spring behind it.

Once the ball check **52** is unseated, liquid or gas may be pumped into the device, causing it to expand. When the surgeon wishes to detract the device, the relief knob on the pump (not shown) is opened and the liquid or gas will bleed back into the pump.

FIG. **2***c* illustrates extension tubing **68**. Extension connector **66** is received within valve connector **36**, allowing remote valve connector **36'** to be used in place of the valve connector **36**. Thus, the prosthetic device **10** may be filled with liquid and gas either through the valve positioned on the base plate member **32** or through the remote extension tubing **68**. Extension tubing **68** is preferable for filling and bleeding of fluids from the collapsible, extendable bellows **26** when the spinal prosthetic device **10** has already been implanted within the spine of the patient.

When the final gap setting has been achieved, the surgeon unscrews the charge fitting **60** and, as needle **64** withdraws, the ball check **52** closes, effecting a seal before the needle **64** passes out beyond O-ring **58**. In order to make the final seal, the surgeon screws plug **62** into the valve connector **36**, or the remote valve connector **36'** if the extension tubing **68** is employed.

FIG. **3** illustrates the preferred embodiment of the spinal prosthetic device **10**, shown in FIG. **2***b*, implanted in the lumbar region of the spine. The device is shown tilted to its maximum of approximately 20° which may be varied to suit. The device is shown as it would be situated if the annulus fibrosus were completely removed. A smaller diameter version of this device configuration similar to FIG. **1** or **2** may be similarly implanted within the space formerly occupied by the nucleus pulposus, wherein the annulus fibrosus is left intact.

FIG. **4***a* is a top view of the spinal prosethetic device **10** with expanded vertebra engaging members **72**. The vertebra engaging members **72** have been modified in this embodiment to incorporate bores **74** for receiving screws **76**, illustrated in FIG. **4***b*. The self-taping screws **76** can be used to secure the expanded vertebra engaging members **72** to their cojoining vertebrae. The surgeon, with the use of a separate drill insert bushing, can use the bores **74** to first pre-drill a screw diameter hole into the vertebrae prior to installing the self-taping screw **76**. This configuration can be used when the annulus fibrosus has been removed. The screws **76** provide further stability and strength for implantation of the spinal prosthetic device **10**. The screws **76** may be used in conjunction with projections **20**, as shown in FIG. **4***b*.

Further shown in FIG. **4***a* is irregular surface **78**. The porous surface **78** forms a mesh or sintered surface for allowing vetebra engaging members **72** to easily join to the vertebrae. In addition to the screws **76**, the vetebra engaging members **72** are held to the bone of the vetebrae by actual growth of the bone into the porous surface **78**. A porous surface **78** is also formed on the vertebra engaging members **12** of the embodiment shown in FIG. **2***a*.

FIG. **5** shows a typical Stress vs. Strain curve showing the behavior of most metal materials. The spinal prosthetic device **10** is designed such that the maximum anticipated load, with a built-in factor of safety, would never exceed the yield point stress allowed for the materials of construction.

FIG. **5** is a typical graph of the Stress vs. Strain or the Stress vs. Deflection of most metal materials. The linear portion of the curve defines what is commonly called the "elastic" portion. If the applied stress never exceeds the linear part of the curve, once the stress is removed, the material will revert back to its original shape. If the stress exceeds the "yield" point for the material, then "plastic" deformation occurs and the material will not revert back to its original shape. If the stress level increases to the "ultimate" value, the material will fail as a support.

The collapsible, extendable bellows **26** are designed such that the "yield point" is never reached and, theoretically, an infinite number of compression/extension and bending cycles can be expected. In bellows systems utilizing Belleville type conical washers made of titanium, hundreds of millions of cycles are routinely imposed without failure. The bellows design incorporates the torsional stability of a coil spring with the tension and compression stability of a leaf spring. Regardless of how the loads are applied, deflection is effected without parts destructively rubbing against one another.

Further, the bellows assembly **26** offers both spring-like action while also lending itself as a container to house a fluid. If this fluid is an incompressible liquid, the bellows will only tilt laterally, not deflect axially. If partially filled with both a gas and a liquid, some axial deflection, as well, will be afforded due to the compressibility of the gaseous portion.

The bellows assembly **26** allow forward, backward and lateral motion within the spine while maintaining axial height rigidity due to the incompressibility of the liquid contained therein. The bellows **26** absorbs the imposed stresses via bending of its convolutions. There is no rubbing of one component against another, thus eliminating wear on the mechanical parts.

In order to afford a torsional degree of motion, simulating natural spinal movement, between the cojoining vertebrae, the upper and lower vertebra engaging members **12** roll on ball bearings **44**. There is virtually no friction, heat or wear produced in the rolling contact between the vertebra engaging members **12** and the ball bearings **44** as long as the yield stress of neither the ball bearing **44** nor the race **48** or **28** is exceeded.

The device may be sized so as to make it adaptable to fit in other regions of the spine, such as the cervical and thoracic regions. Just as the cross-sections of the vertebrae increase in area from the cervical region down to the sacrum, the normal loading encountered increases proportionally. Thus, it follows that the larger the cross-sectional area of the bellows **26**, the lower the imposed stresses will be on the bellows convolutions. The bearing load imposed between the vertebra engaging members **12** and the vertebrae **14** will also be lower.

Titanium which is the preferred metal, is not only biocompatible, it is one of the strongest metals available. It lends itself to handling the pressures and flex-loading stresses encountered in a bellows configuration design.

The spinal prosthetic device **10** may be pre-filled with sterile saline solution at the time of manufacture. The device may, alternatively, be filled with 80%–90% liquid, the remaining volume being gas. This would allow the device to afford some spring action in the axial direction similar to a normal vertebral disk. Alternatively, the bellows **26** may be pre-expanded to be near the final height desired and, in this embodiment, the surgeon would use a separate distracting tool to spread the effected vertebrae apart before inserting the device **10** into final position.

If the surgeon needs to adjust the height of the device **10**, he or she may connect a hand pump to the fill/drain fitting **36** of the device **10** and either bleed fluid out or pump extra fluid in.

In cases where the surgeon desires to keep the annulus fibrosus intact, but cannot distract the vertebrae to their final position at the time of the surgery, the surgeon can attach a short length of capillary braid reinforced tubing **68**, shown in FIG. **2**C, to the bellows device **10** and tuck the entire tubing extension **68** inside the incision prior to closing the patient up.

After a predetermined time, the patient may have an incision formed on an adjacent area of the back. The tubing **68** can be removed for expanding the bellows **10** to the final gap height desired. This could be performed with the aid of real time fluoroscopy.

The radial bearing assembly **24** positioned centrally within the thrust bearing member **22** allows for rotation of the bellows with respect to the vertebra engaging members **12**. Thus, spinal prosthetic device **10** provides lateral tilting, minimal axial compression, and permits rotational movement, thus simulating a natural spinal disk.

Further, the individual washers forming the flexible bellows **26** provide for not only flexibility along the main axis of the spinal prosthetic device **10**, but prevent shear movement in the radial direction. The spinal cord is especially susceptible to injury and damage, and the liquid hydraulic fluid within the bellows assembly **26** prevents the device from being crushed or shifted in the radial direction, thus preventing injury to the sensitive nerves of the spinal cord or aorta.

Although this invention has been described in connection with specific forms and embodiments thereof, it will be appreciated that various modifications other than those discussed above may be resorted to without departing from the spirit or scope of the invention. For example, functionally equivalent elements may be substituted for those specifically shown and described without departing from the spirit or scope of the invention as defined in the appended claims.

What claimed is:

1. A collapsible, rotatable and expandable spinal hydraulic prosthetic device comprising:

a pair of opposed vertebra engaging members, each having a first vertebra engaging surface for joining said vertebra engaging member to a vertebra and having a second bearing surface;

a pair of thrust bearing members, each having a radial bearing assembly, said pair of radial bearing assemblies being fixedly secured to said vertebra engaging members, each of said members being contiguous and rotatable with respect to said second bearing surfaces;

a pair of collapsible, extendable bellows, each having an end cap formed on a first end thereof, said end cap

72

78

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIRECCION DE NUEVAS CREACIONES

202084

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Apoderado

ASUNTO	Radicación	06 – 99845
	Trámite	011
	Evento	378
	Actuación	519
	Oficio	05559
	Folios	011

Patente de Invención	X	Patente de Modelo de Utilidad			
Vía Nacional					
Vía PCT (fase nacional)	X	Cap. I	X	Cap. II	

No. Sol. Internacional PCT/CH2004/000209

Fecha de Presentación Internacional 02-04-2004

Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica:

1. Documentos estudiados

1.1.	Descripción:	Folios	31 a 39
1.2.	Reivindicaciones:	Folios	40 a 42
1.3.	Dibujos:	Folios	44 a 46

2. Objeto de la invención

Título de la solicitud: "IMPLANTE INTERVERTEBRAL MODULAR O PROTESIS DE DISCO INTERVERTEBRAL"

El problema planteado en esta solicitud se refiere a proveer un implante intervertebral modular o prótesis de disco intervertebral, con diferentes piezas medias y un numero de placas de oposición de diferente construcción, que se

pueden asegurar de manera desajustable a estas como resultado, no existe necesidad de hacer un numero de diferentes implantes disponibles para el cirujano, de los cuales el ultimo puede entonces hacer escogencia sobre la base del segmento de la columna afectada, el peso del paciente y la causa particular.

Para solucionar este problema técnico la solicitud en estudio proporciona un implante intervertebral modular o prótesis de disco intervertebral, la cual está presente en la forma de un conjunto de construcción de un numero de piezas medias (para pacientes de diferente peso así como también para pacientes capaces de moverse en una proporción diferente) y un numero de placas de oposición de diferentes construcciones, que se pueden unir de manera desajustable a esta, de tal forma que el cirujano mismo, antes de la operación, pueda ensamblar el implante el cual, en su opinión, sea optimo.

El objeto de la presente invención se lleva acabo de acuerdo con las características reivindicadas, en la reivindicación 1 (ver folio 40).

El objeto de la solicitud definida anteriormente se encuentra en la Clasificación Internacional de Patentes (IPC), A61F2/00, A61F 2/044, A61F2/30.

3. De la solicitud de Patente

3.1. Descripción (artículo 28 D 486)

Se observa que en el capitulo descriptivo se mencionan los elementos (f, n y m) los cuales no están relacionados en las figuras.

Las figuras tienen como finalidad contribuir a una mejor compresión y divulgación de la invención. Los dibujos deben estar explicados en la descripción. Tienen que ser esquemáticos, libre de detalles inútiles, de leyendas y palabras, poniendo en evidencia lo esencial, o sea, las características de la invención, por lo tanto deberán tener ciertas características:

- deben tener relación directa con la descripción;
- deben permitir visualizar las formas de ejecución descritas;
- la relación entre la descripción y los dibujos se debe hacer por medio de signos de referencia que se encuentren en ambos elementos y guarden una correspondencia;
- si dentro de la descripción han sido mencionados algunas figuras, necesariamente deben estar incluidas;
- no deben considerarse figuras o dibujos que no hayan sido descritos;
- deben ser enumerados individualmente y consecutivamente.

En conclusión la descripción no reúne los requisitos de presentación de acuerdo con lo establecido en el Art. 28 de la Decisión 486, la descripción no es clara y completa en divulgar la invención.

De acuerdo con lo anterior, **se sugiere al solicitante presentar un nuevo capítulo Descriptivo.**

3.2. Reivindicaciones (artículo 30 D 486)

Se observa que en las reivindicaciones 5, 6, 16 y 17 se mencionan los elementos (f, n y m) los cuales no están relacionados en las figuras.

Se aconseja que la reivindicación independiente, mencione todas las características conocidas en el estado de la técnica, en el preámbulo, y seguido del término ***"CARACTERIZADO POR"*** se muestren las características técnicas novedosas propias de la solicitud, y que la diferenciarían del estado de la técnica.

Con lo anterior se busca que la reivindicación independiente de mayor claridad y delimite mejor la invención, para reflejar el verdadero alcance de la protección.

4. Determinación del Estado de la Técnica

Se buscaron documentos del estado de la técnica relacionados, con fecha de publicación anterior a 02-04-2004, que pueden afectar la patentabilidad del objeto de la presente solicitud, encontrándose:

Nº	Documento	Título	Fecha de Publicación
D1	US6375682	**Collapsible, rotatable and expandable spinal hydraulic prosthetic device**	Apr 23, 2002

5. Análisis de patentabilidad (artículo 14 D 486)

5.1. Novedad (artículo 16 D 486)

Teniendo en cuenta que el documento **US6375682** (mencionado de ahora en adelante como **D1**), que se refiere a: un "**C Cylinder assembly for a door lock**" y al comparar elemento por elemento de la invención tal como está definido en la reivindicación 1, con el documento **D1**, vemos que el dicho documento contiene todas las características técnicas, como son:

- Unos medios para unir de manera desajustable a una placa de oposición. Ver **D1** Capitulo descriptivo, columnas 3 a 8; elementos 10, 24, 50 y Figuras 1 a 5.

- Una placa de oposición adecuada para la oposición en la placa base o cubrir la placa de un cuerpo de una vértebra. Ver **D1** Capitulo descriptivo, columnas 3 a 8; elementos 10, 24, 50 y Figuras 1 a 5.

Realizada la comparación del documento **D1** con la presente solicitud de patente de invención, se observa que dicho documento contiene todas las características técnicas de la reivindicación 1; con lo cual quedaría desvirtuada la novedad de esta.

6. Conclusión:

Los requisitos de patentabilidad de la presente solicitud se encuentran afectados así:

Nº	Documento Nº	Reivindicaciones Afectadas	Requisito que Afecta
D1	US6375682	1 a 17	Novedad

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta días contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única N° 10 de 2001.

ALIX CARMENZA CÉSPEDES DE VERGEL
Directora de Nuevas Creaciones (C)

El anterior requerimiento fue notificado por fijación en lista, de fecha 30 ABR. 2010

CONCEPTO TÉCNICO No. 636	**EXAMINADOR TÉCNICO** Código No. 84